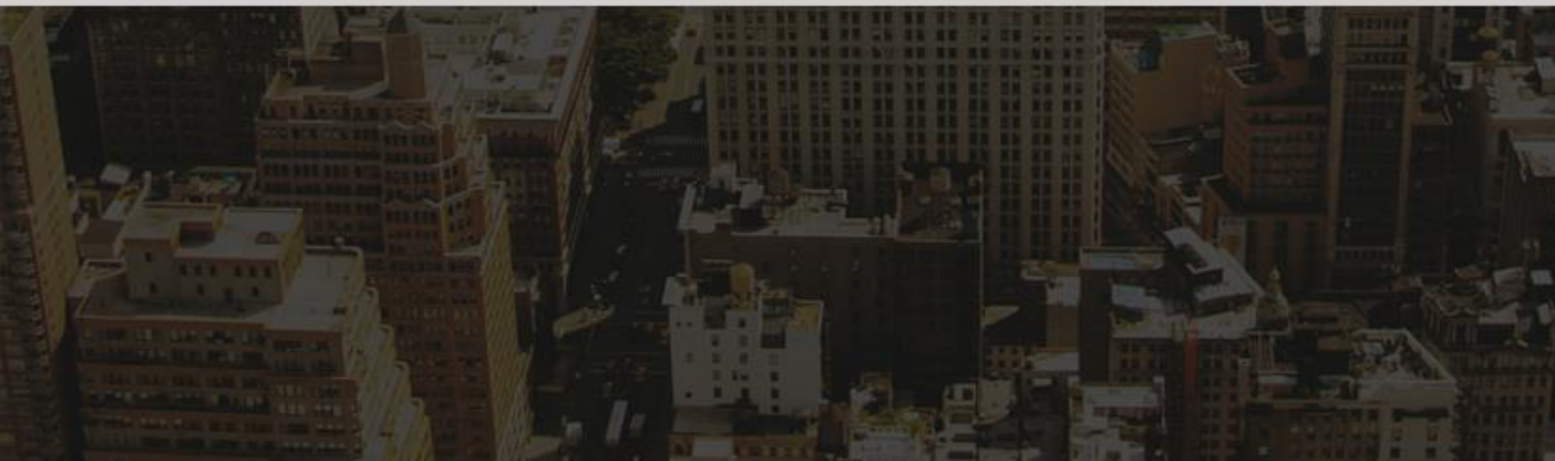


# AMPS Publication Series 8



## Government & Housing in a Time of Crisis Policy, Planning, Design & Delivery

# AMPS CONFERENCE 8

**Government and Housing in a Time of Crisis: Policy, Planning, Design and Delivery.**

AMPS, Architecture\_MPS; Liverpool John Moores University  
08—09 September, 2016

## **Government and Housing in a Time of Crisis: Policy, Planning, Design and Delivery.**

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### **INTRODUCTION**

This publication is the product of the conference *Government and Housing in a Time of Crisis: Policy, Planning, Design and Delivery* held at Liverpool John Moores University in 2016. The premise of the conference and this publication was that in the political economies of the West the provision of social and affordable housing has been subject to major change in recent decades. Nowhere is this more evident than in local and regional government. Today, local authority architects are mostly a thing of the past; house construction by regional administrators is increasingly rare; and local government management of housing is in decline. In place of these models are a plethora of policies, approaches and players. In the UK context these include ALMOs, stock transfers, Section 106 Agreements, right-to-buy, and the growth of Housing Associations etc. In other parts of Europe and across the developed world, the names of such initiatives and groups differ, but the issues in play remain the same. On that basis, the themes of the conference, reflected in this publication, include: Local Authorities, Government and Policy – planning ideas for housing the future; Building and Housing Professionals – ideas from inside (and about) the profession; Community Projects, Artists and Resident Engagement – the experience of users; Research, Academia, Innovation, Design and Case Studies – proposed and implemented models of housing

This publication, and the conference which it documents, were organised by the research organisation AMPS, its academic journal Architecture\_MPS, and the Department of Architecture at Liverpool John Moores University. It formed part of the AMPS program of events, *Housing – Critical Futures*.

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# URBAN REGENERATION OF PUBLIC HOUSING IN SOUTHERN ITALY: APPLICATION OF AN ANALYSIS AND DESIGN METHODOLOGY TO AN EMBLEMATIC CASE-STUDY

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## INTRODUCTION

This essay presents experimental research under way at the “Eduardo Vittoria Academic School of Architecture and Design”, University of Camerino, within the sphere of activities of the Italian Society of Architectural Technology (SITdA)<sup>1</sup>.

The research is focused on the development of a method for an effective approach to the regeneration of the industrialized residential housing districts built, in Italy, between the '60s and '80s and which now have become, after only a few years, a real urban emergency. Currently, they contain rapidly deteriorated, obsolete and often overcrowded homes, completely inadequate to the inhabitants' needs, to the current legislation and to the now accepted performance standards. Within the controversy between "new construction" and "retrofitting the existing" as strategies for the modernisation of the city, the majority of debate has now concentrated on the destiny of these estates. In these areas, physical deterioration reaches exceptional levels, not only for the shoddy quality of their construction but also for the failure of the original planning choices, characterized by the quantitative application of urban standards, the indifference towards the quality of common outdoor spaces, the lack of flexibility levels in the dwelling units (to respond to changes in the needs of their inhabitants).

The fruit of the research carried out to date is *SET\_up* ( “**SETTLEMENT\_upgrade**”), which is an analysis and design method devoted to the regeneration of this mass housing typology, applicable to different case studies in this housing field. The paper illustrates the method configuration, in its broad lines, and some results of the application of *SET\_up* to an emblematic case-study of southern Italy: the PSER intervention in Naples in the '80s.

## ***SET\_up*. An analysis and design methodology for the upgrade of industrialized housing estates**

The principal reference in the *SET\_up* method is the “Open Building Theory”<sup>2</sup>. In accordance with J.N. Habraken's “vision”, in fact, the method works on the assumption that the environment can be “read” on different levels, and that the systemic industrial scheme of industrialized housing can be considered an opportunity to replace some sub-systems, rearrange the spaces, improve the environmental and energy performances. So, the method is based on a pattern which provides a breakdown of housing problems and solutions in three **reference scales** (*neighborhood, building and*

*dwelling*) and as many **strategic levels** (*space/functional, technological/construction, energy/environmental*).

The REFERENCE SCALES focus mainly on:

neighborhood scale

the organization, characterization, functionality of the open space (including pedestrian paths, ramps and lock-ups); b) accesses to the neighborhood; c) the definition of artificial and natural elements necessary to improve the environmental quality of the outdoor spaces; e) the materials for external paving;

building scale

a) the typological and morphological characterization of the buildings; b) the recognition of internal “functional lines” in which to organize, in a rational way, dwellings and connection spaces; c) the treatment of buildings (plan and elevation articulation) in relation to the their position and orientation; d) the organization of the distribution spaces (corridors, galleries, staircases, etc), common spaces, collective services, roof and ground floor; e) the study of ground floors; f) the study of the principal enveloping features in terms of energy performance and morphology; g) the verification of the first architectural outcome;

dwelling scale

a) the distribution, the dimensions, and the orientation of the dwellings; b) the attribution of flexibility and adaptability to the housing spaces on a basis of possible fruition cycles; c) the relation between the housing spaces and the utility network.

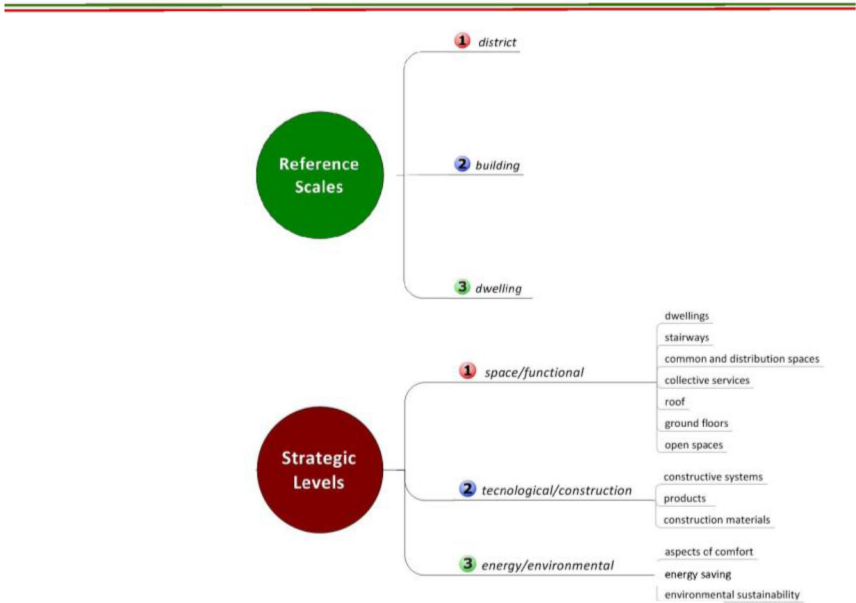


Figure 1 - References and levels in the SET\_up pattern

The STRATEGIC LEVELS refer, in particular, to:

space-functional level

the indoor and outdoor spaces, as a) dwellings; b) stairways; c) lobbies; d) roof; e) ground floor; f) open spaces;

technological-construction level

a) construction systems; b) products; c) construction materials;

### energy-environmental level

aspects of: a) comfort; b) energy saving; c) environmental sustainability (in general).

Levels and scales determine a 3by3 matrix whose rows are occupied by the reference scales and columns by the strategic levels. This matrix is a sort of "navigator" that orientates all the phases of analysis and design. Each intersection of the matrix constitutes a specific field of analysis in which it is also possible to test specific design interventions. In this way, applying SET-up to different case studies, both phases of the general analysis and assessment of design strategies can be reconstructed in the form of a “catalogue” organized in reference scales and strategic levels, as the sum of the work done at each intersection of the matrix,. The more case studies that are analyzed, the more the method can be developed and the catalogue can be exhaustive and incisive.

### **Application of the method to a case-study**

The case-study presented here is the intervention carried out within the still emblematic context of the Extraordinary Residential Construction Plan (PSER) drawn up in Naples following the earthquake of the 23<sup>rd</sup> of November 1980<sup>3</sup>.

Naples and its province represent a place with a strong tradition of housing problems, only partially resulting from a density of population that is among the highest in Europe. The earthquake of 1980 worsened this already dramatic situation. As soon as the gravity of the problem was clear in relation to the earthquake damage, it was decided to take drastic action. First of all, the Mayor of the city was appointed as Superintendent for the Reconstruction with full powers. The strategy adopted was to apply the urban plans already approved by the Administration before the earthquake, originally devoted to the redevelopment of suburbs and not yet effective. A disaster like the earthquake was used as an accelerator of processes that had not been put into practice.

The PSER was drawn up to build new districts or to restore some existing but damaged, amounting to a total of 20,000 dwellings. The new districts were all carried out with industrialized systems. In relation to the technical choices, the methods and the procedures implemented, but also to the dimension of the intervention, the PSER operation was a vanguard and experimental plan in the national history of public urban planning. It should also have been a program of absolute excellence in terms of performance. But, particularly for the new districts, it was not.



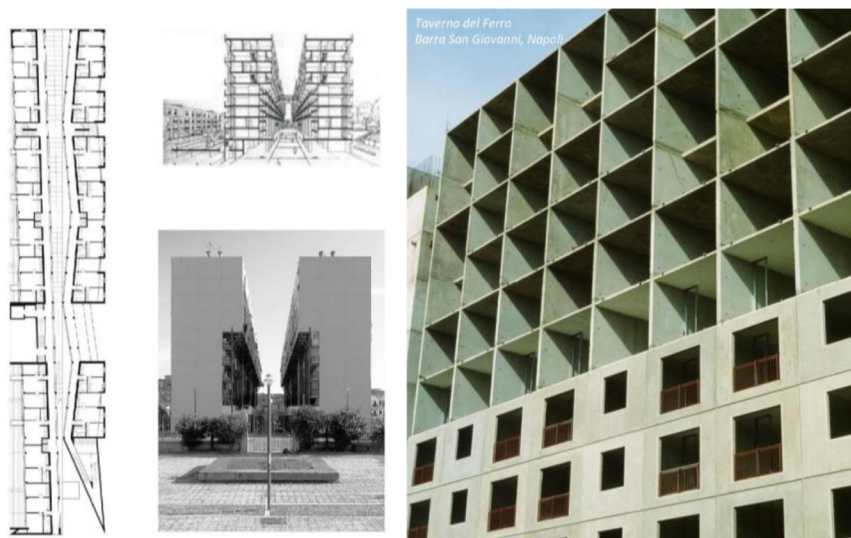


Figure 2. One of PSER interventions: “Taverna del ferro, Barra-San Giovanni neighborhood, Naples

As an example, given below are the results of the application of SET\_UP to one of the 13 new construction areas. In the Sant’Arpino area, *Selva Cafaro* district was built for an original population of 2,800 people in the northern suburbs of Naples. In accordance with the SET\_UP pattern, the neighborhood was critically read at "strategic levels".

## Space/Functional level

The original building typology proposes *linear* solutions for the lower levels and *balcony-housing* solutions for the upper levels. Both typologies are characterized by front-to-back units, with the service block (bathrooms and kitchens) confined to a central band. The size of the apartments varies but rarely exceeds 100 square meters. This implies general overcrowding of housing units (the households are usually of more than four people) that are often penalized by rigid and not always functional living spaces. Part of the ground levels should have been original spaces for commercial activities and services; the open spaces should have been characterized by a dense presence of public parks. Today, the ground floors are closed or improperly used for residential purposes (or lock ups); the open space used as parking areas.

The monotonous repetition of the dwellings and the rigidity of the internal space solutions are the result of a housing model that has been unable to satisfy the needs of the inhabitants, also because of the rigidity of the industrialized construction systems.

## Technological/Construction level

With its multi-storey buildings of 7/8 floors forming two large courtyards, *Selva Cafaro* is a large-size hive of reinforced steel and concrete structures, characterized by wide and degraded open spaces, by the marked obsolescence of the buildings built with non-flexible systems, with shoddy quality, chosen for the economy of the process at the expense of quality. Its position is particularly unfortunate since it is in the center of an intricate infrastructure system (*Capodichino airport* is part of it). Its "gigantic" parallelepipeds (eight buildings, seven floors above ground, 12,600 covered square meters and a volume of 240,000 cubic meters) emerge in an area of approximately 6 hectares, arranged around two large courtyards open to the south-west towards an indefinite and desolate space. The original 540 lodgings have over time increased with the illegal occupation of spaces and rooms originally intended as facilities and common services. The neighborhood is characterized by a substantial difference in the structural system between the two main blocks. The first block of buildings has a metal structure with

pillars and beams, with prefabricated concrete floors; the second is composed of a three-dimensional reinforced concrete system built on site (*tunnel formwork system*<sup>4</sup>). Both the envelope blocks are made up of prefab concrete panels (with interposed insulation) which today is totally inefficient in terms of thermal and acoustic insulation and waterproofing (the roofing systems and windows have the same problem).



Figure 3 - Selva Cafaro neighborhood

### Energy/Environmental level

It is an energy-consuming settlement, and not only for the reduced performance of the concrete panels of the envelope (that time has further reduced). The lack, during the planning and construction phases, of any strategy for reducing energy consumption and increasing thermal comfort has meant that Selva Cafaro is currently far from the now acceptable standards; likewise, the size and the emptiness of its open spaces share the responsibility for the environmental degradation that has resulted over the years. Of course, the issues of energy efficiency and environmental comfort only recently have found stability in construction practices. And yet, in these buildings, there is no trace of that "environmental responsibility" which in those years was in its early stages. The houses are hot in summer and cold in winter and the large outdoor spaces are "dominated" by climatic conditions. This is the reason for the clearly visible attempts at "spontaneous" energy adjustment by the residents, who - using awnings, porches, double glazing and other DIY devices - have created, over time, a supplementary apparatus to improve the level of comfort of their own living space.

In accordance with the SET\_UP method, the neighborhood has been analyzed from the point of view of its performance, considering not only its present condition but also its original condition. In this way it has been possible to identify the defects evident today, after almost thirty years, and to trace the causes which are ascribable to the faulty planning strategies and technological choices adopted. Among the most obvious defects which can be mentioned, are: the lack of a reference social model; the priority with which the households were chosen; the degradation of part of the components and construction systems; improper use of the spaces by the inhabitants; sabotage by the residents as a manifestation of their malcontent.

The results of this analysis have allowed an assessment of the regenerative potential of the district and to experiment a first batch of design strategies among which, in particular:

- the opening of spaces on the ground floors;
- the recovery of roof-top terraces to be allocated to common functions;
- the merging/splitting of the units;



- the addition of new volumes on the facades to increase the living space but used also as energy/environmental devices (greenhouses, shading systems, etc.);
- the total or partial replacement of the envelope systems, including the change of the relationship *opaque/transparent* surfaces on the facades, the use of systems of *brise-soleil* and darkening of the fixtures; the use of solar and photovoltaic devices. In some cases external insulation and finishing system (EIFS) has been planned (instead of the total replacement of the envelope);
- the acoustic insulation of the internal partitions and floors;
- the replacement of utility networks and provision for cooling systems.



Figure 4. A synthesis of some of the design strategies experimented, according to the 3by3 matrix

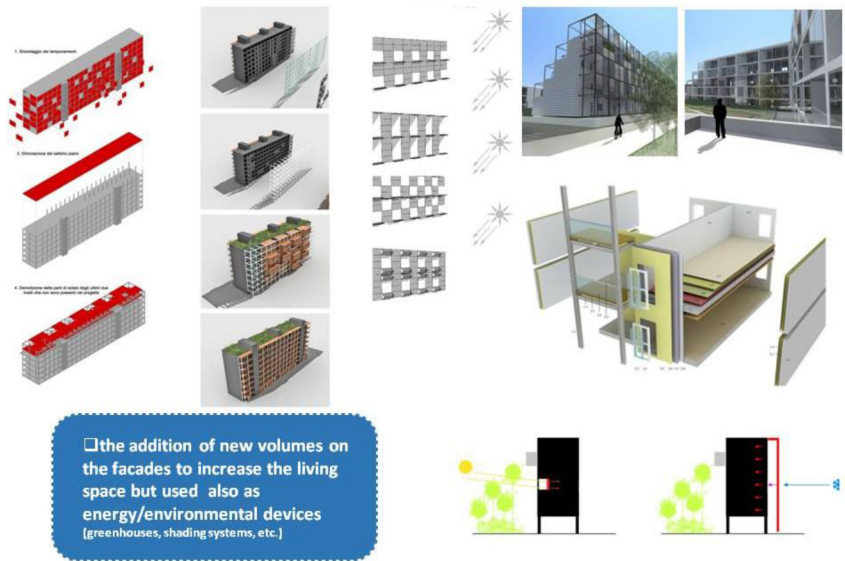


Figure 4-5. Some results of the design application

## Outcomes and open questions

The application of the SET\_UP method to the case-study PSERN has allowed the reconstruction of a clear and accurate picture of the problems that afflict not only the buildings of PSERN, but most of the analogous examples of industrialized housing estates in Italy. In addition, the design experiment performed on Selva Cafaro district - carried out in accordance with the SET\_UP methodological approach and its theoretical assumptions related to the Open Building Theory - has allowed the identification of possible design solutions and technical strategies that, in later research, should be verified in terms of logistics and economic feasibility. These first two results will be implemented through the in-depth study of the PSER districts and by extending the application of the method to other case studies. However, the work done to date shows that upgrading these neighborhoods is technically feasible. It also shows, in particular, that:

- the industrial building season for homes has made constructions that, although degraded in a very short time, enjoy a regenerative potential "different" from the traditional building: a potential that derives not so much from a "dismantling" of the systems and components, as the "systemic conception" that was at the basis of their construction. This specific condition offers them another chance at rehabilitation. In philosophical terms, in accordance with the design methodologies of the "Open Building", it is possible to consider the building structure a unique invariable sub-system and operate on others with greater freedom based on the total or partial replacement of the elements of which it is composed, with the intent to respond to the spatial-functional needs of the final users. This approach suits the specific nature of this kind of housing very well, because it considers the building organism, created using industrialized systems and procedures, as consisting of a fixed and durable support structure and elements with a shorter lifespan that can be wholly disassembled and/or interchanged to respond to the necessities of individuals and family units. This entails the identification of a procedural and normative structure capable of placing the current industrial production at the service of the users' desires. This involves primarily the use of technological systems and industrial products that, opportunely assembled using "dry" building techniques, can be coherently adapted to interventions of retrofitting at different levels of action, offering elevated performance at reasonable costs.
- that regeneration of these building is more suitable with steel pillars and beams than those with three-dimensional concrete systems (coffrage tunnel) in which the rigidity of the system greatly reduces the design variables. However, in both cases, it is clear that a marked renovation of technological systems requires the use of lightweight technologies and devices that are reversible, integratable, achievable with dry assembly techniques, responsive to parameters of simple construction and low maintenance costs. The industrialized wood technologies, in particular OSB, seem particularly appropriate for the necessary transition from a heavy envelope to a lightweight one.
- prior to speaking of the "correction" of energy-performance of the buildings it is necessary to consider a "re-signification" - first - of open and common spaces in environmental terms, defining new uses, spatial qualities and levels of comfort. These spaces must also be treated as an integrated system of energy/environmental devices as, for example: solar shading, natural and artificial systems for protection against prevailing winds, greenhouses, systems for balancing temperature and humidity throughout the district, systems for accumulation and reuse of rainwater. The primary focus of this new environmental system lies more in the settlement than its individual buildings.
- for many of the neighborhoods, like those created by PSER, the current Social Housing policies in force in Italy are not realistically applicable. Neither is it reasonable to conjecture, in a short - and -



medium term, that these areas will be the object of gentrification on the basis of the Anglo-Saxon model (assuming this to be valid ). In many cases, these neighborhoods have become real slums that need extraordinary programs for which it appears unrealistic to foresee incentive formulas that can attract private capital;

- its regeneration, even before being of an urban and technological nature, should occur first on the social level. In many cases the situation is so compromised that it appears very unlikely that a similar process can be triggered without a re-appropriation by the State of the areas that today escape, at least in part, its control;
- in these areas, “bottom-up” intervention strategies (starting from the community’s initiatives) may be desirable, but by themselves will not be decisive;
- the complexity of the problem requires "extraordinary" measures, as was the case of the PSER where extraordinary measures were adopted after the earthquake.
- equally inevitable appears the need to operate through public – national and European - funding;
- regenerating these neighborhoods needs, first, an infrastructure and connection plan (with neighboring towns), considering that “isolation” is one of the principal causes of their present degradation.

This experience of research carried out to date shows that a systematic solution to this kind of emergency seems, in the context of central and southern Italy, still far away. However, it is clear that the density of these settlements and the negative impact that they have on the urban contexts they belong to make the definition of incisive action policies a priority.

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<sup>1</sup> SITdA that is a scientific society that brings together academics, researchers and operators interested in the field of architectural technologies and innovation in construction. SITdA is organized in thematic clusters which constitute a research network. The authors of this work are all members of the cluster “Social Housing” (SH), which includes (actually) 82 researchers and is organized in 12 units operating within the main Italian universities in the field of urban and environmental renewal of public housing built between the 1950’s and 1980’s. Since 2007, SITdA pursues the promotion, implementation, and dissemination of the research in this area of interest through seminars, conferences and publications (some of which are published on its scientific magazine “Techne”).

<sup>2</sup> “Open Building” (OB) is an approach to the design of buildings that is recognized internationally to represent a new wave in architecture. As is known, J. N. Habraken is the father of this approach. The OB theory is based on some original point of view, including: a) the building can be theoretically considered the intersection of systems composed of a number of different components, each of which would be tackled separately; b) it is possible to reconsider *structure* as a unique invariable sub-system (*support*) and operate on others with greater freedom based on the total or partial replacement of the elements of which it is composed (*infill*), with the intent of responding to the spatial-functional needs of the end users (“support-infill concept”, was explained in *Supports: An Alternative to Mass Housing*, which was first published in 1961); c) the State provide the infrastructure on which people could build their own housing; d) the interface between technical systems allows the replacement of one system with another performing the same function; e) the built environment is the product of an ongoing, never ending design process, in which the environment is transformed part by part.

<sup>3</sup> In particular, the earthquake hit the regions of Campania and Molise and had devastating effects. Only in the municipal area of Naples, which was not the hardest hit area because of the remoteness from the epicenter, 52 people died and there was several damage to buildings and infrastructures.

1 *Tunnel form* is a formwork system that allows the contractor to cast walls and slabs in one operation in a daily cycle. It combines the speed, quality and accuracy of factory/off-site production with the flexibility and economy of in-situ construction. The result is a cellular reinforced structure, the surfaces of which are sufficiently high quality to require only minimal finishing for direct decoration, while the end walls and facades are easily completed with thermally insulated units that can be clad as required. The result is a repetitive cellular construction, unsuitable in terms of flexibility and adaptability of indoor spaces.

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